

REMARKS

Reconsideration of the application is respectfully requested. Claims 1-11 remain pending, no claims have been amended or added.

Objection to the Specification

The Examiner has objected to the specification because of an informality, specifically that in "the first sentence of the specification, an updated lineage of the present application should be provided."

On page 2 of the preliminary amendment filed concurrently with the filing of the application on September 8, 2003, the following line was added after the title on page 1:

This is a division of US App. No. 09/710,626 filed
November 10, 2000 and issued September 9, 2003 as
US Pat. No. 6,617,248.

This line added concurrently with the filing of the application is believed to be a complete and current lineage of the present application. Thus the Examiner's objection is believed to be in error, and the withdrawal of the objection is respectfully requested.

Obviousness-type Double Patenting

Claims 1-11 have been rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-14 of US Pat. No. 6,617,248 (the "'248 patent").

Claims 1-11 of the '248 patent and claims 1-11 of the present application were all present in the application leading to the '248 patent and subject to an election required by the Examiner in the parent application hereto (now the '248 patent) in the office action of November 30, 2001. An election was made by the applicant's agent in the response of December 21, 2001 electing species B (now claims 1-11 of US Pat. No. 6,617,248) and canceling species A (claims 1-11 of the present application). The claims are consonant with the restriction requirement made by the Examiner, and have not been changed in material respects from the claims at the time the requirement was made. More specifically, the claims of the present invention recite a "method for forming a ruthenium metal layer," which is the line of demarcation between the independent and distinct inventions identified by the Examiner in the requirement for restriction on November 30, 2001. Thus an obviousness-type double patenting rejection is in error as being improper (see 35 USC §121, MPEP §804.01) and is respectfully traversed. Withdrawal of the obviousness-type double patenting rejection is respectfully requested.

Rejection under 35 USC §112

Claims 1-11 have been rejected under 35 USC §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, in claim 1 line 6, the phrase "smooth-surfaced" is deemed a relative term which renders the claim indefinite. The Examiner asserts that the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention. The same issue applies to claims 4 and 7.

It is submitted that various teachings within the specification which contrast a "rough" surface as opposed to a "smooth" surface sufficiently enable one of ordinary skill in the art to appraise the scope of the invention. The first complete paragraph on page 5 recites, for example, that

"when the flow rate of O₂ was around 200 sccm during the above-described formation of RuO₂...the completed ruthenium metal layer was relatively uniform and had minimal pinholing. At an O₂ flow rate above or below about 200 sccm...the completed ruthenium metal layer was subject to an increasingly rough surface the further the flow rate varied from about 200 sccm. While a smooth ruthenium metal layer will be desirable in most uses, a rough layer may also be useful, for example to form a layer having an increased surface area."

Thus, for purposes of the present invention as claimed, a "smooth" layer is one which does not have a perceptible increase in its surface area contributed by surface roughness. One of ordinary skill in the art would understand this concept, which is much like a smooth polysilicon layer contrasted with a rough hemispherical silicon grain (HSG) polysilicon layer which has an increased surface area resulting from surface roughness.

The paragraph beginning at line 15 of page 8 states in part that the "exemplary embodiment described above will provide a smooth capacitor ruthenium metal bottom plate layer. It may be desirable to provide a rough bottom plate layer to increase the surface area and therefore the capacitance between the bottom and top plates." Again, this paragraph teaches that the smooth layer does not have an increased surface area resulting from a roughness of the layer. The surface roughness would increase the capacitance between the bottom and top plates.

Further, US Patent 6,617,248 from which this application is a divisional, issued September 9, 2003. The '248 patent includes claim 1, for example, which employs the language "...to form a smooth-surfaced ruthenium metal layer...". As an issued patent is presumed valid, the language is clearly sufficient and succinct to one of ordinary skill in the art, and is allowable in light of the teaching of the specification. Allowance of this language in the claims of the parent case based on a specification having the same teachings with regard to a "smooth" surface contrasted to a "rough" surface would appear to be *prima facie* evidence that the language is sufficiently clear.

As evidenced by the teaching specified above in the specification, and by the allowance of the language in the parent case which is rejected to by the Examiner under 35 USC §112 in the present case, the language is clear and provides a sufficient standard for ascertaining the scope of the invention to one of ordinary skill in the art. Thus the Examiner's rejection of the claim language under 35 USC §112 is respectfully traversed. Claims 1, 4, and 7, and their dependent claims are therefore allowable under 35 USC §112.

Conclusion

If there are any matters which may be resolved or clarified through a telephone call, the Examiner is cordially invited to contact the undersigned. This is believed to be a complete response to the Examiner's office action.

Respectfully submitted,

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